



1

## SEQUENCE LISTING

<110> Brodeur, Bernard R.  
 Martin, Denis  
 Martin, Josee  
 Rioux, Clement

<120> PROTEINASE K RESISTANT SURFACE PROTEIN  
 OF NEISSERIA MENINGITIDIS

<130> 484112.417C1

<140> US 09/684,883  
 <141> 2000-10-06

<150> US 08/913,362  
 <151> 1997-11-13

<150> PCT/CA96/00157  
 <151> 1996-03-15

<150> US 60/001,983  
 <151> 1995-08-04

<150> US 08/406,362  
 <151> 1995-03-17

<160> 34

<170> FastSEQ for Windows Version 4.0

<210> 1  
 <211> 830  
 <212> DNA  
 <213> Neisseria meningitidis

<220>  
 <221> CDS  
 <222> (143)...(667)

<220>  
 <221> sig\_peptide  
 <222> (143)...(199)

<220>  
 <221> mat\_peptide  
 <222> (200)...(667)

<400> 1  
 tcggc aaagc agccggat acgtacgtat cttgaagtat tgaaaatatt acgatgcaaa 60  
 aaagaaaatt taagtataat acagcaggat tctttaacgg attcttaaca atttttctaa 120  
 ctgaccataa aggaacacaa at atg aaa aaa gca ctt gcc aca ctg att gcc 172

Met Lys Lys Ala Leu Ala Thr Leu Ile Ala

-15

-10

ctc gct ctc ccg gcc gcc gca ctg gcg gaa ggc gca tcc ggc ttt tac 220  
 Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr  
                   -5                                  1                                  5

gtc caa gcc gat gcc gca cac gca aaa gcc tca agc tct tta ggt tct 268  
 Val Gln Ala Asp Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly Ser  
                   10                                  15                                  20

gcc aaa ggc ttc agc ccg cgc atc tcc gca ggc tac cgc atc aac gac 316  
 Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp  
                   25                                  30                                  35

ctc cgc ttc gcc gtc gat tac acg cgc tac aaa aac tat aaa gcc cca 364  
 Leu Arg Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro  
                   40                                  45                                  50                                  55

tcc acc gat ttc aaa ctt tac agc atc ggc gcg tcc gcc att tac gac 412  
 Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp  
                                   60                                  65                                  70

ttc gac acc caa tcg ccc gtc aaa ccg tat ctc ggc gcg cgc ttg agc 460  
 Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser  
                                   75                                  80                                  85

ctc aac cgc gcc tcc gtc gac ttg ggc ggc agc gac agc ttc agc caa 508  
 Leu Asn Arg Ala Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln  
                   90                                  95                                  100

acc tcc atc ggc ctc ggc gta ttg acg ggc gta agc tat gcc gtt acc 556  
 Thr Ser Ile Gly Leu Gly Val Leu Thr Gly Val Ser Tyr Ala Val Thr  
                   105                                  110                                  115

ccg aat gtc gat ttg gat gcc ggc tac cgc tac aac tac atc ggc aaa 604  
 Pro Asn Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys  
                   120                                  125                                  130                                  135

gtc aac act gtc aaa aac gtc cgt tcc ggc gaa ctg tcc gtc ggc gtg 652  
 Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu Leu Ser Val Gly Val  
                                   140                                  145                                  150

cgc gtc aaa ttc tga tatgcgcctt attctgcaaa ccgccgagcc ttccggcggtt 707  
 Arg Val Lys Phe \*  
                                   155

ttgttttctg ccaccgcaac tacacaagcc ggcggttttg tacgataatc ccgaatgctg 767  
 cggcttctgc cgccctatctt tttgaggaat ccgaaatgtc caaaaccatc atccacaccg 827  
 aca 830

&lt;210&gt; 2

&lt;211&gt; 174

&lt;212&gt; PRT

<213> *Neisseria meningitidis*

<220>

<221> SIGNAL

<222> (1)...(19)

<400> 2

```

Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala
      -15      -10      -5
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
      1          5          10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
      15      20      25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
      30      35      40      45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
      50      55      60
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
      65      70      75
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
      80      85      90
Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Ile Gly Leu Gly
      95      100     105
Val Leu Thr Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
      110     115     120     125
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
      130     135     140
Val Arg Ser Gly Glu Leu Ser Val Gly Val Arg Val Lys Phe
      145     150     155

```

<210> 3

<211> 710

<212> DNA

<213> *Neisseria meningitidis*

<220>

<221> CDS

<222> (116)...(643)

<220>

<221> sig\_peptide

<222> (116)...(172)

<220>

<221> mat\_peptide

<222> (173)...(643)

<400> 3

```

gtatcttgag gcattgaaaa tattacaatg caaaaagaaa atttcagtat aatacggcag 60
gattctttaa cggattctta accatttttc tcctgacca taaaggaatc aagat atg 118
                                         Met

```

```

aaa aaa gca ctt gcc gca ctg att gcc ctc gcc ctc ccg gcc gcc gca 166
Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala Ala
-15 -10 -5

ctg gcg gaa ggc gca tcc ggc ttt tac gtc caa gcc gat gcc gca cac 214
Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala His
1 5 10

gcc aaa gcc tca agc tct tta ggt tct gcc aaa ggc ttc agc ccg cgc 262
Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro Arg
15 20 25 30

atc tcc gca ggc tac cgc atc aac gac ctc cgc ttc gcc gtc gat tac 310
Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp Tyr
35 40 45

acg cgc tac aaa aac tat aaa caa gtc cca tcc acc gat ttc aaa ctt 358
Thr Arg Tyr Lys Asn Tyr Lys Gln Val Pro Ser Thr Asp Phe Lys Leu
50 55 60

tac agc atc ggc gcg tcc gcc att tac gac ttc gac acc caa tcc ccc 406
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
65 70 75

gtc aaa ccg tat ctc ggc gcg cgc ttg agc ctc aac cgc gcc tcc gtc 454
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
80 85 90

gac ttt aac ggc agc gac agc ttc agc caa acc tcc acc ggc ctc ggc 502
Asp Phe Asn Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu Gly
95 100 105 110

gta ttg gcg ggc gta agc tat gcc gtt acc ccg aat gtc gat ttg gat 550
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
115 120 125

gcc ggc tac cgc tac aac tac atc ggc aaa gtc aac act gtc aaa aat 598
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
130 135 140

gtc cgt tcc ggc gaa ctg tcc gcc ggc gta cgc gtc aaa ttc tga 643
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe *
145 150 155

tatacgcggtt attccgcaaa ccgccgagcc ttccggcggt tttgttttcc gccgccgcaa 703
ctacaca 710

```

<210> 4

<211> 175

<212> PRT

<213> Neisseria meningitidis

<220>

<221> SIGNAL

<222> (1)...(19)

<400> 4

```

Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala
      -15      -10      -5
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
      1      5      10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
      15      20      25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
30      35      40      45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Gln Val Pro Ser Thr Asp Phe Lys
      50      55      60
Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser
      65      70      75
Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser
      80      85      90
Val Asp Phe Asn Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu
      95      100      105
Gly Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu
110      115      120      125
Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys
      130      135      140
Asn Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
      145      150      155

```

<210> 5

<211> 850

<212> DNA

<213> *Neisseria meningitidis*

<220>

<221> CDS

<222> (208)...(732)

<220>

<221> sig\_peptide

<222> (208)...(264)

<220>

<221> mat\_peptide

<222> (265)...(732)

<400> 5

```

cacccatccg ccgcgtgatg ccgccaccac catttaaagg caacgcgcgg gttaacggct 60
ttgccgtcgg caaagcagcc ggaaccgct acgtatcttg aagtattaaa aatattacga 120
tgcaaaaaga aaatttaagt ataataaagc agaattcttt aacggattct taacaatttt 180
tctaactgac cataaaggaa ccaaaat atg aaa aaa gca ctt gcc aca ctg att 234
Met Lys Lys Ala Leu Ala Thr Leu Ile

```

-15

```

gcc ctc gct ctc ccg gcc gcc gca ctg gcg gaa ggc gca tcc ggc ttt 282
Ala Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe

```

```

-10          -5          1          5

tac gtc caa gcc gat gcc gca cac gca aaa gcc tca agc tct tta ggt 330
Tyr Val Gln Ala Asp Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly
          10          15          20

tct gcc aaa ggc ttc agc ccg cgc atc tcc gca ggc tac cgc atc aac 378
Ser Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg Ile Asn
          25          30          35

gac ctc cgc ttc gcc gtc gat tac acg cgc tac aaa aac tat aaa gcc 426
Asp Leu Arg Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala
          40          45          50

cca tcc acc gat ttc aaa ctt tac agc atc ggc gcg tcc gcc att tac 474
Pro Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr
          55          60          65          70

gac ttc gac acc caa tcg ccc gtc aaa ccg tat ctc ggc gcg cgc ttg 522
Asp Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu
          75          80          85

agc ctc aac cgc gcc tcc gtc gac ttg ggc ggc agc gac agc ttc agc 570
Ser Leu Asn Arg Ala Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser
          90          95          100

caa acc tcc acc ggc ctc ggc gta ttg gcg ggc gta agc tat gcc gtt 618
Gln Thr Ser Thr Gly Leu Gly Val Leu Ala Gly Val Ser Tyr Ala Val
          105          110          115

acc ccg aat gtc gat ttg gat gcc ggc tac cgc tac aac tac atc ggc 666
Thr Pro Asn Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly
          120          125          130

aaa gtc aac act gtc aaa aac gtc cgt tcc ggc gaa ctg tcc gcc ggt 714
Lys Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu Leu Ser Ala Gly
          135          140          145          150

gtg cgc gtc aaa ttc tga tatgcgcctt attctgcaaa ccgccgagcc 762
Val Arg Val Lys Phe *
          155

ttcgcggtt ttgttttctg ccaccgcaac tacacaagcc ggcggttttg tacgataatc 822
ccgaatgctg cggcttctgc cgccctat 850

```

<210> 6

<211> 174

<212> PRT

<213> Neisseria meningitidis

<220>

<221> SIGNAL

<222> (1)...(19)

&lt;400&gt; 6

```

Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala
      -15      -10      -5
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
      1      5      10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
      15      20      25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
      30      35      40      45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
      50      55      60
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
      65      70      75
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
      80      85      90
Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu Gly
      95      100      105
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
      110      115      120      125
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
      130      135      140
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
      145      150      155

```

&lt;210&gt; 7

&lt;211&gt; 810

&lt;212&gt; DNA

&lt;213&gt; Neisseria gonorrhoeae

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (241)...(765)

&lt;220&gt;

&lt;221&gt; sig\_peptide

&lt;222&gt; (241)...(297)

&lt;220&gt;

&lt;221&gt; mat\_peptide

&lt;222&gt; (298)...(765)

&lt;400&gt; 7

```

ccccgccttt gcggtttttt ccaaaccgtt tgcaagtttc acccatccgc cgcgtgatgc 60
cgccgtttta gggcaacgcg cgggttaacg gatttgccgt cggcaaagca gccggatgcc 120
gccgcgtatc ttgaggcatt gaaaatatta cgatgcaaaa agaaaatttc agtataatac 180
ggcaggattc tttaacggat tattaacaat tttctccct gaccataaag gaaccaaatt 240
atg aaa aaa gca ctt gcc gca ctg att gcc ctc gca ctc ccg gcc gcc 288
Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala
      -15      -10      -5

gca ctg gcg gaa ggc gca tcc ggc ttt tac gtc caa gcc gat gcc gca 336
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
      1      5      10

```

cac gcc aaa gcc tca agc tct tta ggt tct gcc aaa ggc ttc agc ccg 384  
 His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro  
 15 20 25  
 cgc atc tcc gca ggc tac cgc atc aac gac ctc cgc ttc gcc gtc gat 432  
 Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp  
 30 35 40 45  
 tac acg cgc tac aaa aac tat aaa gcc cca tcc acc gat ttc aaa ctt 480  
 Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu  
 50 55 60  
 tac agc atc ggc gcg tcc gtc att tac gac ttc gac acc caa tcg ccc 528  
 Tyr Ser Ile Gly Ala Ser Val Ile Tyr Asp Phe Asp Thr Gln Ser Pro  
 65 70 75  
 gtc aaa ccg tat ttc ggc gcg cgc ttg agc ctc aac cgc gct tcc gcc 576  
 Val Lys Pro Tyr Phe Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Ala  
 80 85 90  
 cac ttg ggc ggc agc gac agc ttc agc aaa acc tcc gcc ggc ctc ggc 624  
 His Leu Gly Gly Ser Asp Ser Phe Ser Lys Thr Ser Ala Gly Leu Gly  
 95 100 105  
 gta ttg gcg ggc gta agc tat gcc gtt acc ccg aat gtc gat ttg gat 672  
 Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp  
 110 115 120 125  
 gcc ggc tac cgc tac aac tac gtc ggc aaa gtc aac act gtc aaa aac 720  
 Ala Gly Tyr Arg Tyr Asn Tyr Val Gly Lys Val Asn Thr Val Lys Asn  
 130 135 140  
 gtc cgt tcc ggc gaa ctg tcc gcc ggc gtg cgc gtc aaa ttc tga 765  
 Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe \*  
 145 150 155  
 tatacgcgtt attccgcaaa ccgccgagcc ttcggcggtt ttttg 810

<210> 8

<211> 174

<212> PRT

<213> Neisseria gonorrhoeae

<220>

<221> SIGNAL

<222> (1)...(19)

<400> 8

Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala  
 -15 -10 -5  
 Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala  
 1 5 10  
 His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro

15	20	25													
Arg	Ile	Ser	Ala	Gly	Tyr	Arg	Ile	Asn	Asp	Leu	Arg	Phe	Ala	Val	Asp
30					35					40					45
Tyr	Thr	Arg	Tyr	Lys	Asn	Tyr	Lys	Ala	Pro	Ser	Thr	Asp	Phe	Lys	Leu
				50					55					60	
Tyr	Ser	Ile	Gly	Ala	Ser	Val	Ile	Tyr	Asp	Phe	Asp	Thr	Gln	Ser	Pro
			65				70						75		
Val	Lys	Pro	Tyr	Phe	Gly	Ala	Arg	Leu	Ser	Leu	Asn	Arg	Ala	Ser	Ala
	80						85					90			
His	Leu	Gly	Gly	Ser	Asp	Ser	Phe	Ser	Lys	Thr	Ser	Ala	Gly	Leu	Gly
	95				100						105				
Val	Leu	Ala	Gly	Val	Ser	Tyr	Ala	Val	Thr	Pro	Asn	Val	Asp	Leu	Asp
110					115					120					125
Ala	Gly	Tyr	Arg	Tyr	Asn	Tyr	Val	Gly	Lys	Val	Asn	Thr	Val	Lys	Asn
			130					135						140	
Val	Arg	Ser	Gly	Glu	Leu	Ser	Ala	Gly	Val	Arg	Val	Lys	Phe		
			145					150					155		

<210> 9  
 <211> 16  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 9  
 Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala  
 1 5 10 15

<210> 10  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 10  
 Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe  
 1 5 10 15

<210> 11  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 11  
 Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala His Ala Lys  
 1 5 10 15

<210> 12  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

&lt;400&gt; 12

Ala	Ala	His	Ala	Lys	Ala	Ser	Ser	Ser	Leu	Gly	Ser	Ala	Lys	Gly
1				5					10					15

&lt;210&gt; 13

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Neisseria meningitidis

&lt;400&gt; 13

Gly	Ser	Ala	Lys	Gly	Phe	Ser	Pro	Arg	Ile	Ser	Ala	Gly	Tyr	Arg
1				5					10					15

&lt;210&gt; 14

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Neisseria meningitidis

&lt;400&gt; 14

Ser	Ala	Gly	Tyr	Arg	Ile	Asn	Asp	Leu	Arg	Phe	Ala	Val	Asp	Tyr
1				5					10					15

&lt;210&gt; 15

&lt;211&gt; 16

&lt;212&gt; PRT

&lt;213&gt; Neisseria meningitidis

&lt;400&gt; 15

Phe	Ala	Val	Asp	Tyr	Thr	Arg	Tyr	Lys	Asn	Tyr	Lys	Ala	Pro	Ser	Thr
1				5					10						15

&lt;210&gt; 16

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Neisseria meningitidis

&lt;400&gt; 16

Tyr	Lys	Ala	Pro	Ser	Thr	Asp	Phe	Lys	Leu	Tyr	Ser	Ile	Gly	Ala
1				5					10					15

&lt;210&gt; 17

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Neisseria meningitidis

&lt;400&gt; 17

Tyr	Ser	Ile	Gly	Ala	Ser	Ala	Ile	Tyr	Asp	Phe	Asp	Thr	Gln	Ser
1				5					10					15

<210> 18  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 18  
 Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu  
 1 5 10 15

<210> 19  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 19  
 Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val Asp Leu Gly  
 1 5 10 15

<210> 20  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 20  
 Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Ile  
 1 5 10 15

<210> 21  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 21  
 Ser Gln Thr Ser Ile Gly Leu Gly Val Leu Thr Gly Val Ser Tyr  
 1 5 10 15

<210> 22  
 <211> 15  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 22  
 Thr Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp Ala  
 1 5 10 15

<210> 23  
 <211> 15  
 <212> PRT

<213> Neisseria meningitidis

<400> 23

Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val  
1 5 10 15

<210> 24

<211> 15

<212> PRT

<213> Neisseria meningitidis

<400> 24

Tyr Ile Gly Lys Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu  
1 5 10 15

<210> 25

<211> 14

<212> PRT

<213> Neisseria meningitidis

<400> 25

Val Arg Ser Gly Glu Leu Ser Val Gly Val Arg Val Lys Phe  
1 5 10

<210> 26

<211> 25

<212> PRT

<213> Neisseria meningitidis

<400> 26

Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr  
1 5 10 15  
Asp Phe Lys Leu Tyr Ser Ile Gly Ala  
20 25

<210> 27

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 27

taatagatct atgaaaaaag cacttgccac

30

<210> 28

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 28

attagatctt cagaatttga cgcgcac

27

<210> 29

<211> 528

<212> DNA

<213> Unknown

<220>

<223> Consensus sequence

<400> 29

```

atgaaaaaag cacttgccrc actgattgcc ctgcgctcc cggccgccgc actggcggaa 60
ggcgcatccg gcttttacgt ccaagccgat gccgcacacg cmaaagcctc aagctcttta 120
ggttctgcca aaggcttcag cccgcgcacg tccgcaggct accgcatcaa cgacctccgc 180
ttcgccgctg attacacgcg ctacaaaaac tataaacaag ycccatccac cgatttcaaa 240
ctttacagca tcggcgcgctc cgycatttac gacttcgaca cccaatcscg cgtcaaaccg 300
tatytcgggc cgcgcttgag cctcaaccgc gcytccgycs acttkrrcgg cagcgacagc 360
ttcagcmaaa cctccrycgg cctcggcgta ttgrcggggc taagctatgc cgttaccccg 420
aatgtcgatt tggatgccgg ctaccgctac aactacrth gcaaagtcaa cactgtcaaa 480
aaygtccgtt ccggcgaact gtccgycgyy gtrcgcgtca aattctga 528

```

<210> 30

<211> 175

<212> PRT

<213> Unknown

<220>

<223> Consensus sequence

<220>

<221> VARIANT

<222> 7, 73, 126

<223> Xaa = Any Amino Acid

<400> 30

```

Met Lys Lys Ala Leu Ala Xaa Leu Ile Ala Leu Ala Leu Pro Ala Ala
 1          5          10          15
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
          20          25          30
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
          35          40          45
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
          50          55          60
Tyr Thr Arg Tyr Lys Asn Tyr Lys Xaa Ala Pro Ser Thr Asp Phe Lys
65          70          75          80
Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser
          85          90          95
Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser
          100          105          110

```

Val	Asp	Leu	Gly	Gly	Ser	Asp	Ser	Phe	Ser	Gln	Thr	Ser	Xaa	Gly	Leu
		115					120					125			
Gly	Val	Leu	Ala	Gly	Val	Ser	Tyr	Ala	Val	Thr	Pro	Asn	Val	Asp	Leu
		130				135					140				
Asp	Ala	Gly	Tyr	Arg	Tyr	Asn	Tyr	Ile	Gly	Lys	Val	Asn	Thr	Val	Lys
145					150				155					160	
Asn	Val	Arg	Ser	Gly	Glu	Leu	Ser	Ala	Gly	Val	Arg	Val	Lys	Phe	
				165					170					175	

<210> 31  
 <211> 9  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 31  
 Glu Gly Ala Ser Gly Phe Tyr Val Gln  
 1 5

<210> 32  
 <211> 10  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 32  
 Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala  
 1 5 10

<210> 33  
 <211> 19  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 33  
 Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala  
 1 5 10 15  
 Ala Leu Ala

<210> 34  
 <211> 19  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 34  
 Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala  
 1 5 10 15  
 Ala Leu Ala